

Dear educational colleague,

SANOFI AVENTIS BIOTALENT CHALLENGE and the MERCK “EXPLORING MINDS” BIOSCIENCE LECTURES AND WORKSHOPS

This year’s group of young investigators have researched topics as diverse as the genetic engineering of pathogen resistance in plants and the practicality of using fruit and vegetable extracts against *H. pylori*, the causative agent of ulcers.

The SABC continues to offer a unique opportunity for curious and creative students to have a “graduate level” research experience under the guidance of professional scientists. Nineteen projects have advanced to the competition this year.

The Toronto student teams will compete for \$12,000 in cash prizes and scholarships at Ryerson University on April 19 and 20, 2011. The national competition will be held in Ottawa later in May.

Once again, Bioscience Education Canada is offering free bioscience lectures and workshops to high school classes accompanied by their teachers. This program has been made available through the generous sponsorship of Merck, a company that has been a long time supporter of our educational outreach for youth. The lectures and workshops will take place at Ryerson University in the George Vari Engineering and Computing Centre on Tuesday April 19th and Wednesday April 20th, 2011.

Registration for these lectures must be done through the Bioscience Education Science office at 416-640-0206 (info@bioscienceeducation.ca). We ask that you try to book your classes for two lectures and a workshop. Further information and lecture availability can be found on the SABC website (www.sanofibiotalentchallenge.ca) and on the Bioscience Education Canada website (www.bioscienceeducation.ca).

Merck "Exploring Minds" Lectures High School Lecture Schedule Ryerson University		
Tuesday, April 19, 2011		
10:00 a.m.	"Stem Cells: Promise and Problems" Mr. Paul Cassar, Institute of Medical Science, University of Toronto Room ENG103 (capacity 300)	"Who are poo? How CSI technology is used to reconstruct microbiological communities in solid waste from treatment plants" Dr. Kimberley Gilbride, Department of Chemistry and Biology, Ryerson University Room ENGLG02 (capacity 90)
11:00 a.m.	"Rocket science is for kids. Cancer research is for you" Dr. Michelle Brazas, Ontario Institute for Cancer Research Room ENG103 (capacity 300)	
Noon	"DNA Barcoding for Biodiversity Analysis" Dr. Mehrdad Hajibabaei, Biodiversity Institute of Ontario & Integrative Biology, University of Guelph Room ENG103 (capacity 300)	"Crime Science" Centre of Forensic Science Room ENGLG02 (capacity 90)
1:00 p.m.	"Mighty microbes: turning trash into cash" Dr. Emma Master Dept. of Chemical Engineering, University of Toronto Room ENG103 (capacity 300)	"Can my computer protect me against the flu?" Dr Catherine Beauchemin, Department of Physics, Ryerson University Room ENGLG02 (capacity 90)
Wednesday, April 20, 2011		
10:00 a.m.	"The Future of Medicine – your health and your genome" Dr. Alison Symington, Ontario Genomics Institute Room ENG103 (capacity 300)	"When a picture is worth a thousand words - how macromolecular structures advance our understanding of biology" Dr. Logan Donaldson, Department of Biology, York University Room ENGLG02 (capacity 90)
11:00 a.m.	"Crime Science" Centre of Forensic Science Room ENG103 (capacity 300)	"Biomedical ultrasound and photoacoustics: using ultra-sound and highly illuminating techniques to better understand tissue structure and function". Dr Michael Kolios, Department of Physics, Ryerson University Room ENGLG02 (capacity 90)
Noon	"Life is a Hammerfest: How to extract the most out of 24h. Exercise as the elixir of life." Dr. Mark Tarnopolsky, McMaster University Medical Center Room Room ENG103 (capacity 300)	
1:00 p.m.	The human body: Solving the 100,000,000,000,000 cell puzzle Dr Roberto Botelho, Department of Chemistry and Biology, Ryerson University Room ENG103 (capacity 300)	



Merck "Exploring Minds" Workshops
Schedule
Ryerson University

Time	Tuesday, April 19, 2011		
10:00 a.m.		"FRONTIERS IN GENOMICS" Faculty, Department of Biological Sciences and Applied Chemistry, Seneca College Room ENGLG12 (Capacity 50)	"BIRTH WEIGHT MEASUREMENT IN MIDWIFERY AND MOBILE HEALTH CARE DELIVERY" Biomedical Engineering Dr James Smith and Jamil Jivraj, Ryerson University (Limited Capacity 20) 1 1/2 hrs
11:00 a.m.	"MICROARRAYS" Ms Maria Calimano, Centennial College (Capacity 50)	"A MICROBIAL MYSTERY" Faculty, Department of Biological Sciences and Applied Chemistry, Seneca College Room ENGLG12 (Capacity 50)	
NOON	LUNCH		LUNCH
			"BIRTH WEIGHT MEASUREMENT IN MIDWIFERY AND MOBILE HEALTH CARE DELIVERY" Biomedical Engineering Dr James Smith and Jamil Jivraj, Ryerson University (Limited Capacity 20) 1 1/2 hrs
1:00 p.m.		"CSI AT HOME AND IN THE LAB" Faculty, Department of Biological Sciences and Applied Chemistry, Seneca College Room ENGLG12 (Capacity 50)	
	Wednesday, April 20, 2011		
10:00 a.m.			"BIRTH WEIGHT MEASUREMENT IN MIDWIFERY AND MOBILE HEALTH CARE DELIVERY" Biomedical Engineering Dr James Smith and Jamil Jivraj, Ryerson University (Limited Capacity 20) 1 1/2 hrs
11:00 a.m.		"USING BIOINFORMATICS TO ANALYZE HUMAN DISEASE" Dr. Paula Demacio, Centennial College Room TBA (Capacity 36)	
NOON	LUNCH		LUNCH
			"BIRTH WEIGHT MEASUREMENT IN MIDWIFERY AND MOBILE HEALTH CARE DELIVERY" Biomedical Engineering Dr James Smith and Jamil Jivraj, Ryerson University (Limited Capacity 20) 1 1/2 hrs
1:00 p.m.		"USING BIOINFORMATICS TO ANALYZE HUMAN DISEASE" Dr. Paula Demacio, Centennial College Room TBA (Capacity 36)	

MERCK “EXPLORING MINDS” BIOSCIENCE LECTURE AND WORKSHOP

Outlines

(Program with Ontario Curriculum links)

Tuesday, April 19th, 10:00 a.m.

"STEM CELLS: PROMISE AND PROBLEMS"

Mr. Paul Cassar, Institute of Medical Science, University of Toronto

This presentation will give background on stem cell research with specific reference to the understanding of the underlying mechanism that governs embryonic stem cell fate decisions.

- Genetics (Gr. 11 – SBI3C)
- Cellular Biology (Gr. 11-SBI3C)
- Genetic Processes (Gr. 11-SBI3U)
- Evolution (Gr. 11-SBI3U)
- Diversity of Living Things (Gr. 11-SBI3U)
- Science and Public Health Issues (Gr. 12-SNC4M)
- Medical Technologies (Gr. 12-SNC4M)
- Molecular Genetics (Gr. 12-SBI4U)
- Biotechnology (Gr. 12-SNC

Tuesday, April 19th, 10:00 a.m.

“WHO ARE POO?”

Dr Kimberley Gilbride, Department of Chemistry and Biology, Ryerson University

How CSI technology is used to reconstruct microbiological communities in solid waste from treatment plants.

- Cellular Biology (Gr. 11-SBI3C)
- Genetic Processes (Gr. 11-SBI3U)
- Molecular Genetics (Gr. 12-SBI4U)
- Science and Public Health Issues (Gr. 12-SNC4M)
- Medical Technologies (Gr. 12-SNC4M)
- Biotechnology (Gr. 12-SNC4M)

Tuesday, April 19th, 11:00 a.m.

“ROCKET SCIENCE IS FOR KIDS. CANCER RESEARCH IS FOR YOU.”

**Dr. Michelle Brazas, Research Associate, Manager of Bioinformatic Education,
Ontario Institute for Cancer Research**

Cancer can be a scary word, but researchers around the world are working hard to change that. This talk will explore the many aspects of cancer research from looking at the genome of a tumour, to using a computer to model mutations in 3D and building a dye to visualize tumours when they are only 1mm big. By working together, cancer researchers are making a difference. Come and be a part of the future in cancer research.

- Genetics (Gr. 11 – SBI3C)
- Cellular Biology (Gr. 11-SBI3C)
- Genetic Processes (Gr. 11-SBI3U)
- Evolution (Gr. 11-SBI3U)
- Diversity of Living Things (Gr. 11-SBI3U)
- Science and Public Health Issues (Gr. 12-SNC4M)
- Medical Technologies (Gr. 12-SNC4M)
- Molecular Genetics (Gr. 12-SBI4U)
- Biotechnology (Gr. 12-SNC4M)

Tuesday, April 19th, 12:00 p.m. noon

"DNA BARCODING FOR BIODIVERSITY ANALYSIS"

Dr. Mehrdad Hajibabaei, Biodiversity Institute of Ontario & Integrative Biology, University of Guelph

An outline of how comparative DNA analysis is helping to categorize the various life forms on earth.

- Genetics (Gr. 11 – SBI3C)
- Cellular Biology (Gr. 11-SBI3C)
- Genetic Processes (Gr. 11-SBI3U)
- Evolution (Gr. 11-SBI3U)
- Diversity of Living Things (Gr. 11-SBI3U)
- Molecular Genetics (Gr. 12-SBI4U)
- Biotechnology (Gr. 12-SNC4M)

Tuesday, April 19th, 12:00 p.m. noon

"CRIME SCIENCE"

(Speaker from the Centre of Forensic Sciences)

Discover the latest advances in the field of crime fighting. Join a forensic scientist to investigate how DNA analysis and body-fluid identification methods are used to solve real criminal cases.

- Genetics (Gr. 11 – SBI3C)
- Cellular Biology (Gr. 11-SBI3C)
- Genetic Processes (Gr. 11-SBI3U)
- Science and Public Health Issues (Gr. 12-SNC4M)
- Medical Technologies (Gr. 12-SNC4M)
- Molecular Genetics (Gr. 12-SBI4U)
- Biotechnology (Gr. 12-SNC4M)

Tuesday, April 19th, 1:00 p.m.

"MIGHTY MICROBES: TURNING TRASH INTO CASH"

Dr. Emma Master, Dept. of Chemical Engineering, University of Toronto

Learn how the genomic resources of micro-organisms can be exploited to produce new products, to remediate wastes and to recover valuable energy and materials.

- Genetics (Gr. 11 – SBI3C)
- Cellular Biology (Gr. 11-SBI3C)
- Genetic Processes (Gr. 11-SBI3U)
- Diversity of Living Things (Gr. 11-SBI3U)
- Science and Public Health Issues (Gr. 12-SNC4M)
- Molecular Genetics (Gr. 12-SBI4U)
- Biotechnology (Gr. 12-SNC4M)

Tuesday, April 19th, 1:00 p.m.

"CAN MY COMPUTER PROTECT ME AGAINST THE FLU?"

Dr Catherine Beauchemin, Department of Physics, Ryerson University

How we use mathematics and computers to better understand how flu spreads within a person or a cell culture.

- Genetics (Gr. 11 – SBI3C)
- Cellular Biology (Gr. 11-SBI3C)
- Genetic Processes (Gr. 11-SBI3U)
- Evolution (Gr. 11-SBI3U)
- Science and Public Health Issues (Gr. 12-SNC4M)
- Medical Technologies (Gr. 12-SNC4M)
- Molecular Genetics (Gr. 12-SBI4U)
- Biotechnology (Gr. 12-SNC4M)

Wednesday, April 20th, 10:00 a.m.

"THE FUTURE OF MEDICINE – YOUR HEALTH AND YOUR GENOME"

Dr. Alison Symington, Vice President, Outreach, Ontario Genomics Institute

Would you want to know the details of your genome- what hidden traits will affect your health and longevity? This session will outline the technologies available and make you think about the ethical and legal issues of personalized medicine.

- Genetics (Gr. 11 – SBI3C)
- Cellular Biology (Gr. 11-SBI3C)
- Genetic Processes (Gr. 11-SBI3U)
- Evolution (Gr. 11-SBI3U)
- Science and Public Health Issues (Gr. 12-SNC4M)
- Medical Technologies (Gr. 12-SNC4M)
- Molecular Genetics (Gr. 12-SBI4U)
- Biotechnology (Gr. 12-SNC4M)

Wednesday, April 20th, 10:00 a.m.

"WHEN A PICTURE IS WORTH A THOUSAND WORDS - HOW MACROMOLECULAR STRUCTURES ADVANCE OUR UNDERSTANDING OF BIOLOGY"

Dr. Logan Donaldson, Associate Professor, Department of Biology, York University

Nuclear Magnetic Resonance Spectroscopy allows us to determine the three-dimensional structures of proteins involved in brain cell signalling. This detailed information can be used to discover the subtle changes in the way proteins interact with each other and contribute to the progression of Alzheimer's Disease.

- Cellular Biology (Gr. 11-SBI3C)
- Genetic Processes (Gr. 11-SBI3U)
- Science and Public Health Issues (Gr. 12-SNC4M)
- Medical Technologies (Gr. 12-SNC4M)
- Molecular Genetics (Gr. 12-SBI4U)
- Biotechnology (Gr. 12-SNC4M)

Wednesday, April 20th, 11:00 a.m.

"CRIME SCIENCE"

(Speaker from the Centre of Forensic Sciences)

Discover the latest advances in the field of crime fighting. Join a forensic scientist to investigate how DNA analysis and body-fluid identification methods are used to solve real criminal cases.

- Genetics (Gr. 11 – SBI3C)
- Cellular Biology (Gr. 11-SBI3C)
- Genetic Processes (Gr. 11-SBI3U)
- Science and Public Health Issues (Gr. 12-SNC4M)
- Medical Technologies (Gr. 12-SNC4M)
- Molecular Genetics (Gr. 12-SBI4U)
- Biotechnology (Gr. 12-SNC4M)

Wednesday, April 20th, 11:00 a.m.

"BIOMEDICAL ULTRASOUND AND PHOTOACOUSTICS: USING ULTRA-SOUND AND HIGHLY ILLUMINATING TECHNIQUES TO BETTER UNDERSTAND TISSUE STRUCTURE AND FUNCTION".

Dr Michael Kolios, Department of Physics, Ryerson University

- Cellular Biology (Gr. 11-SBI3C)
- Genetic Processes (Gr. 11-SBI3U)
- Medical Technologies (Gr. 12-SNC4M)
- Molecular Genetics (Gr. 12-SBI4U)
- Biotechnology (Gr. 12-SNC4M)

Wednesday, April 20th, 12:00 p.m. noon

"LIFE IS A HAMMERFEST: HOW TO EXTRACT THE MOST OUT OF 24H. EXERCISE AS THE ELIXIR OF LIFE."

Dr. Mark Tarnopolsky, McMaster University Medical Center

Learn how exercise alters neuromuscular and neurometabolic conditions and affects the long term welfare of an individual.

- Genetics (Gr. 11 – SBI3C)
- Cellular Biology (Gr. 11-SBI3C)
- Genetic Processes (Gr. 11-SBI3U)
- Science and Public Health Issues (Gr. 12-SNC4M)
- Medical Technologies (Gr. 12-SNC4M)
- Molecular Genetics (Gr. 12-SBI4U)
- Biotechnology (Gr. 12-SNC4M)

Wednesday, April 20th, 1:00 p.m.

“THE HUMAN BODY: SOLVING THE 100,000,000,000,000 CELL PUZZLE”

Dr Roberto Botelho, Department of Chemistry and Biology, Ryerson University

Learn some of the tricks that scientists use to study how cells work and communicate with each other to build the ultimate, beautiful machine: the human body.

- Genetics (Gr. 11 – SBI3C)
- Cellular Biology (Gr. 11-SBI3C)
- Genetic Processes (Gr. 11-SBI3U)
- Medical Technologies (Gr. 12-SNC4M)
- Molecular Genetics (Gr. 12-SBI4U)
- Biotechnology (Gr. 12-SNC4M)

The Merck “Exploring Minds” Workshops

Tuesday, April 19, 10:00 a.m.

“FRONTIER IN GENOMICS”

Faculty, Department of Biological Sciences and Applied Chemistry, Seneca College

Students enrolled in this workshop will get hands-on experience in genomic identification of drug targets, new proteins and genetic differences between people.

Tuesday, April 19, 10:00 a.m.

"MICROARRAYS"

Ms Maria Calimano, Centennial College

This is a simulation of the use of one of the most valuable tools in analyzing genomes.

Tuesday, April 19, 2011 11:00 a.m.

“A MICROBIAL MYSTERY”

Faculty, Department of Biological Sciences and Applied Chemistry, Seneca College

An outbreak occurs! A bacterial contaminant is suspected! How do microbiologists determine the identity of the microscopic culprit? Be a microbial sleuth and track down the world's smallest living organisms.

Tuesday, April 19, 2011 1:00 p.m.

“CSI AT HOME AND IN THE LAB”

Faculty, Department of Biological Sciences and Applied Chemistry, Seneca College

Learn how to isolate DNA using only materials that you can find in your household. Then, using special techniques learn how they can lead to catching the criminal.

Wednesday, April 20 11:00 p.m. and 1:00 p.m.

"USING BIOINFORMATICS TO ANALYZE HUMAN DISEASE"

Dr. Paula Demacio, Centennial College

This session is a hands-on demonstration of the bioinformatic tools that are available for studying genes and proteins.

Tuesday April 19 and Wednesday, April 20 10:00 a.m. and 12:30 p.m.
4 sessions (each with capacity of 20)

**“BIRTH WEIGHT MEASUREMENT IN MIDWIFERY AND MOBILE HEALTH CARE
DELIVERY”**

**Dr James Smith, Programme Director, Biomedical Engineering, Department of Computing and
Electrical Engineering, and Jamil Jivraj, Ph.D. Candidate, Biomedical Engineering**

This is a bioengineering workshop in which students are asked to design and construct a mechanical or electromechanical system to measure the weight of a baby immediately after birth and at discrete intervals representing growth over a simulated two month period.